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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,145	01/21/2005	Kenji Yamada	122432	3642
25944	7590	12/06/2006	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			BEHM, HARRY RAYMOND	
			ART UNIT	PAPER NUMBER
			2838	

DATE MAILED: 12/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/523,145	<b>Applicant(s)</b> YAMADA, KENJI	
	<b>Examiner</b> Harry Behm	<b>Art Unit</b> 2838	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 November 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-8, 10, 15-17, 19, 23-25 and 27 is/are rejected.
- 7) ☒ Claim(s) 5, 9, 11-14, 18, 20-22, 26 and 28-30 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date <u>11/9/2006</u>                             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application  |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                           |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments filed 11/20/06 have been fully considered but they are not persuasive. Applicant argues that because the amended claims have overcome the Examiner's objection from the office action sent 7/13/06, the claims are allowable. Applicant has successfully overcome the objections that 'the reference property' and 'the follow up property' used unconventional and ambiguous terminology. However, Applicant still claims "is consistent with" to relate the transient response with a reference transient response. It is well known in mathematics and in general use, that 'consistent' means 'not contradictory', therefore Applicant claims the voltage converter's response is not contradictory with a reference response. Since the transient response is determined by a system's inherent properties, any voltage converter's transient response must be consistent with a reference transient response.

Applicant's arguments with respect to the amended claims 2-30 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Objections***

Claim 1 is objected to because of the following informalities: "to provide an output voltage" lacks antecedent basis. Appropriate correction is required.

It is unclear in Claim 1, whether "a DC power supply" refers to a DC power source, such as a battery in Fig. 1 B, or a DC link voltage, such as  $V_m$  in Fig. 1. Clarification is requested.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 15 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Sawtell (US 5,949,225).

With respect to Claim 1, Sawtell discloses a voltage conversion apparatus converting a direct current voltage from a DC power supply (Fig. 1 Vs) into an output voltage (Fig. 1 Vo) such that said output voltage is equal to a designated voltage (Fig. 1 Vref), comprising: a voltage converter (Fig. 1) altering a voltage level of said direct current voltage (Fig. 1 Vs) to provide the output voltage (Fig. 1 Vo), a detection unit (Fig. 3 312) detecting the output voltage (Fig. 1 Vo) output from said voltage converter, and a control unit (Fig. 3 300, Fig. 1 122) controlling said voltage converter based on said determined control gain (Fig. 3 316), said detected difference (Fig. 3 Vc), and said detected output voltage (Fig. 3 Vfb), into said output voltage (Fig. 3 Vout), wherein a transient response property of said output voltage (Fig. 3 Vout) with respect to said designated voltage (Fig. 3 Vref) in feedback control is consistent [not contradicting] with a reference transient response property, and said output voltage (Fig. 3 Vout) is equal [Vfb equals Vref in steady state] to said designated voltage (Fig. 3 Vref).

With respect to Claims 15 and 23, Sawtell discloses a voltage conversion method of converting a direct current voltage (Fig. 1 Vin) from a DC power supply (Fig. 1 Vs)

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into an output voltage (Fig. 1  $V_o$ ) under feedback control such that said output voltage is equal to a designated voltage (Fig. 1  $V_{ref}$ ), said method comprising [note the preamble is not explicitly claimed and will not be given weight, so claims 23-30 are treated as claims 15-23, respectively]: a first step of detecting said output voltage (Fig. 3 312), a second step of detecting a difference between said designated voltage and said output voltage (Fig. 3 326), a third step of determining a control gain in accordance with said detected difference (Fig. 3 316), and a fourth step of converting said direct current voltage (Fig. 1  $V_{in}$ ), based on said determined control gain (Fig. 3 316), said detected difference (Fig. 3  $V_c$ ), and said detected output voltage (Fig. 3  $V_{fb}$ ), into said output voltage (Fig. 3  $V_{out}$ ), wherein a transient response property of said output voltage (Fig. 3  $V_{out}$ ) with respect to said designated voltage (Fig. 3  $V_{ref}$ ) in said feedback control is consistent [not contracting] with a reference transient property, and said output voltage (Fig. 3  $V_{out}$ ) is equal [ $V_{fb}$  equals  $V_{ref}$  in steady state] to said designated voltage.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by DeDoncker (US 5,373,195).

With respect to Claim 1, DeDoncker discloses a voltage conversion apparatus (Fig. 2 10) converting a direct current voltage from a DC power supply (Fig. 2 22) into an output voltage (Fig. 2  $V_{DC}$ ) such that said output voltage is equal to a designated voltage [desired reference voltage is computed based on motor speed along a predetermined torque envelope], comprising: a voltage converter (Fig. 2 20) altering a voltage level of said direct current voltage (Fig. 2 +dc bat) to provide the output voltage (Fig. 2 + $V_{bat}$ ), a detection unit (Fig. 2 36) detecting the output voltage output from said

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voltage converter, and a control unit (Fig. 2 30,50) controlling said voltage converter based on said detected output voltage (Fig. 2 Vdc) and said designated voltage [determined as a function of motor speed, such as with lookup table as shown in Fig. 3], wherein a transient response property of said voltage converter with respect to said designated voltage in feedback control is consistent with [the term 'consistent' has a well accepted meaning in mathematics and in general use to mean 'not contradictory'] a reference transient response property [inherently, the actual transient response will not be contradictory with reference transient response] and said output voltage is equal to said designated voltage [VDC is regulated to the desired designated voltage by gating control 50].

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 6-8,10, 15-17, 19, 23-25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeDoncker (US 5,373,195) in view of Kerner (US 6,127,793).

With respect to Claims 1-4, 6-8 and 10, DeDoncker discloses the voltage conversion apparatus as set forth above, wherein the voltage converter (Fig. 2 20) includes a chopper circuit (Fig. 2 TB1,TB2 switching transistors). DeDoncker does not disclose calculating a control gain as a function of the voltage error, that is the

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difference between the feedback output voltage and the designated reference voltage. Kerner teaches using the voltage error (Fig. 2 output of summing junction to block AE) to set the control gains (Fig. 2 PI) and teaches such limitations as a subtractor (Fig. 2 ns-ni), a gain determination unit (Fig. 2 AE) determining the gain based upon the difference [voltage error], calculating the preliminary voltage control value based on the determined control gain (Fig. 2 PI), and correcting said preliminary control value (Fig. 2 AE). It would have been obvious to one of ordinary skill in the art at the time of the invention to set the control gains as a function of the desired transient response (Fig. 3), such that the transient response is equal to a desired reference transient response, such as one without overshoot. The reason for doing so is to perform "automatic determination of controller parameters for speed regulation" (Kerner column 2, lines 13-15).

With respect to Claims 15-17, 19, 23-25 and 27, DeDoncker in view of Kerner disclose the method as set forth above.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tan (US 6,751,510) discloses gain scheduling based on the error signal. Samad (US 5,847,952) discloses estimating gains based on the feedback.

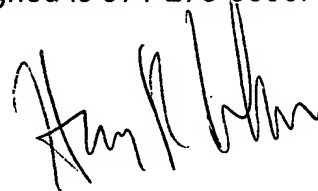
Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry Behm whose telephone number is 571-272-8929. The examiner can normally be reached on Business EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Karl Easthom can be reached on 571-272-1989. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



KARL EASTHOM  
SUPERVISORY PATENT EXAMINER